How to Maximize Your Current CA 1 Solution

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Abstract

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CA 1 delivers tape data protection, library management, and automation to typical z/OS organizations that process thousands of tape files daily. In this session you will learn the latest enhancements and features to maximize your current tape management operations..

Agenda

- CA 1 Tape Management recent enhancements
  - SMFQ Subtask (base r12.6)
  - Missing Operating System Intercepts (base r12.6)
  - Audit Blockset Processing (post r12.6)
  - SMF Recovery Utility (post r12.6)
  - MSM Configuration Improvements (post r12.6)
  - Volume Pool Monitor (post r12.6)
  - Health Check Improvement (post r12.6)
  - Documentation Changes (post r12.6)
- CA 1 Tape Management future enhancements

SMFQ Subtask

- To address an enqueue lockout between a task attempting to catalog/un-catalog a tape file and another task going through standard OPEN/CLOSE processing.

    - A major feature added with R12.6 was a new SMFQ optional subtask to the CTS address space

    - If the address space is present, instead of updating the TMC from the CATALOG address space during a catalog/un-catalog operation, an entry is placed in a private (above-the-bar) queue

    - Both improves catalog processing (much faster to place an entry into a storage queue then to update the TMC/AUDIT) and eliminates the potential lockout

SMFQ Subtask (cont.)

- Fully documented in the Administration Guide
- To activate, the SMFQ subtask should be defined and started to the CTS address space.
  SET TASK(SMFQ) PGM(TMSSMFQ)
  START SMFQ
- It is not required that the SMFQ be active on all systems, but would be recommended.
- If the SMFQ fails, updates are still performed the existing way (directly from the CATALOG address space
- In addition to START and STOP there is also a STATUS display that may be issued.

Missing Operating System Intercepts

- On rare occasions the CA 1 dynamic intercepts are partially removed when another product does a page-release on pages that it did not fix.

  - During WTO processing for a new tape mounted to satisfy a scratch request, we will check if the CA 1 dynamic intercepts are all still active.

  - New highlighted message is issued warning that the CA 1 dynamic intercepts are no longer active

Audit Blockset Processing – the problem

- To address a performance problem
  - CA 1 customers with a very large number of DSNB updates have performance problems which can impact tape processing.
    - The apparent reason is a "bottleneck" updating the Audit File.
  - An update of a single TMC record requires a reserve/release and 3 or 4 I/Os to the Audit file.
    - Adding a DSNB record can require 3 different updates to the TMC.
  - While the Audit file is reserved, no other CPUs may update the Audit file and likely the TMC.

Audit Blockset Processing – the solution

- BLOCKSET mode is a new optional feature which is activated by a new Audit file format.

- The new Audit improves performance by reducing reserves and updates of CTL#4, and by eliminating almost all reserves

- TMSFORMT control statement;

  *FORMAT AUDIT=nnnnnnn,**BLOCKSET***

- This is done by assigning a block of audit records for an LPAR to use rather than a single record. This means that CTL#4 will be reserved and updated less often.

Audit Blockset Processing – the solution

- A half-track blocked AUDIT file can contain 75 records in each block. This eliminates 2 or 3 I/O's to the AUDIT file 74 out of 75 times. On the 75th update, 3 I/O's will again be required.

- Assigned block can only be updated by a single LPAR so there is no need for reserves or reads before the records are written or re-written.

- Multiple time zones are now supported using GMT/UTC time stamps.

TMSSMF Recovery Utility

- The TMSSMF utility allows for the recovery of CA 1 TMC tracking information that was lost due to any circumstance in which CA 1 was inactive.

- SMF must have been active recording Type 14 and 15 records
  - Type 14 – The dataset was opened for INPUT or RDBACK
  - Type 15 – The dataset was opened for OUTPUT, UPDAT, INOUT, or OUTIN

- Can use SMF log stream or data set recording:
  - IFASMFDL used for dumping SMF log streams
  - IFASMFDP used for dumping SMF data sets

TMSSMF Recovery Utility - JCL

```
//stepname  EXEC PGM=TMSSMF
           [,PARM='[MODE=DETAIL|SUMMARY][,DATEFMT=(fmt)]']
//STEPLIB  DD DSN=CAI.CTAPLINK,DISP=SHR
//TMSRPT   DD SYSOUT=A
//SYSOUT   DD SYSOUT=A
//SMFINPUT DD DSN=your.smf.extract.file,DISP=SHR,
//            UNIT=xxxxxxxx,VOL=SER=nnnnnn
//TMSUPDTE DD DSN=CAI.CA1.TMSUPDTE.TRANS,DISP=(NEW,CATLG,DELETE),
//            UNIT=SYSDA,VOL=SER=aaaaaa,SPACE=(TRK,(5,5),RLSE),
//            DCB=(RECFM=FB,LRECL=80,BLKSIZE=n*80,DSORG=PS)
//TMSAGGR  DD DSN=CAI.CA1.TMSAGGR.TRANS,DISP=(NEW,CATLG,DELETE),
//            UNIT=SYSDA,VOL=SER=bbbbbb,SPACE=(TRK,(20,20),RLSE),
//            DCB=(RECFM=FB,LRECL=80,BLKSIZE=n*80,DSORG=PS)
//SYSIN    DD *
(control statements here)
/*
```

TMSSMF Recovery Utility – Detail Report

```
TMS REPORT-66 SMF RECOVERY UTILITY

PARMS RECEIVED:
MODE=    DETAIL
DATEFMT= MMMDDYYYY
ACCT=    TMSSMF RECORD RECOVERY TAPES


----------------DATA SET NAME--------------------VOLSER-VOLSEQ---FSEQ--TYPE---DATE-------TIME-----
     TEST.FIRST                                   001517  001  00001   15  NOV082012   11:53
     TEST.FIRST                                   001518  002  00001   15  NOV082012   11:53
     TEST.SECOND                                  001518  002  00002   15  NOV082012   11:53
     TEST.THIRD                                   001518  002  00003   15  NOV082012   11:53
     TEST.FOURTH                                  001518  002  00004   15  NOV082012   11:53
     TEST.FOURTH                                  001519  003  00004   15  NOV082012   11:53
     TEST.FIFTH                                   001519  003  00005   15  NOV082012   11:53
     TEST.THIS.FIR                                001520  003  00001   15  NOV082012   11:53
     TEST.THIS.FIR                                001521  004  00001   15  NOV082012   11:53
     TEST.THIS.SEC                                001521  004  00002   15  NOV082012   11:53
     TEST.THIS.THD                                001521  004  00003   15  NOV082012   11:53
     TEST.THIS.FOR                                001521  004  00004   15  NOV082012   11:53
     TEST.THIS.FOR                                001523  005  00004   15  NOV082012   11:53
     TEST.THIS.FFT                                001523  005  00005   15  NOV082012   11:53
     TEST.THIS.THD                                001521       00003   14  NOV082012   11:54


FIRST SMF RECORD READ:         11:52 NOV082012
LAST  SMF RECORD READ:         11:54 NOV082012
TOTAL SMF RECORDS READ:                     24
TOTAL TYPE 14 RECORDS SELECTED:              1
TOTAL TYPE 15 RECORDS SELECTED:             14
TOTAL SMF RECORDS NOT SELECTED:              9
```

CA 1 CA Chorus Software Manager (CA CSM) Configuration Improvements

- Several improvements to CA 1 Configuration
  - Creation of TMC and Audit is now optional
  - CA 1 System Options panels have been reorganized
  - Fewer variables required for Configuration – 00 suffix is always used
- Delivered as PTF RO52199
- Provides a new version of XML metadata used by Configuration
- After applying PTF you must do new Deployment and Configuration to see changes

CA 1 CSM Configuration – TMC / Audit Option

New option has been added to let you choose to create a new TMC and Audit file or use your existing TMC and Audit file.

CA 1 CSM Configuration – System Options

Target Settings ►
- CA 1 Base Variables
- CA 1 TMC and AUDIT file Attributes
- CA 1 System Options
  - Company Information
  - Tape processing options
  - Data set retention option
  - Security options
  - Exit options
  - CA 1 SMF exits
  - Cycling options
  - Miscellaneous options

Specifies the Uncatalog Action at Scratch Time. Enter YES, NO or GDG to either allow TMSCLEAN to uncatalog all data sets, prevent TMSCLEAN from uncataloging, or exclude GDG datasets and datasets expired from Cycle Control or Catalog Control. The CA 1 default is GDG, however, as a best practice CA recommends that you set this value to YES.

Click Confirm or select a value from the list for UNCATA then click Set Value.

- CA 1 System Options are now grouped by function, similar to ISPF grouping
- Some options will default to a best practice value, not the documented default value.

CA 1 CSM Configuration – System Options

- The following parameters have been changed to a "best practice" value instead of the CA 1 default
- The best practice value is only set by Configuration

Option	Default	New Best Practice
AUDB4	NONE	BATCH
CREATE	UPDATE	CREATE
DCHG	NO	YES
LOGSVC	ALL	UPDATE
RV	0	30
TCHG	NO	YES
UNCATA	GDG	YES

Volume Pool Monitor

- Volume Pool Monitor (VPM) is an optional feature which provides a new way to monitor tape activity for pools of CA 1 managed tapes.

- VPM uses a new CTS subtask to monitor the status of volumes in user defined pools and record their status in a VSAM data base.

- At intervals, the status of these pools are compared to user defined rules and email/WTO "alerts" are sent if required.

- Model emails/WTOs are created and customized by the user. They may contain "substitution variables" which can provide values for the alert conditions.

- All information about pools, alerts, substitution variables, and the options that control VPM reside in the VSAM data base (VDB).

Volume Pool Monitor - Features
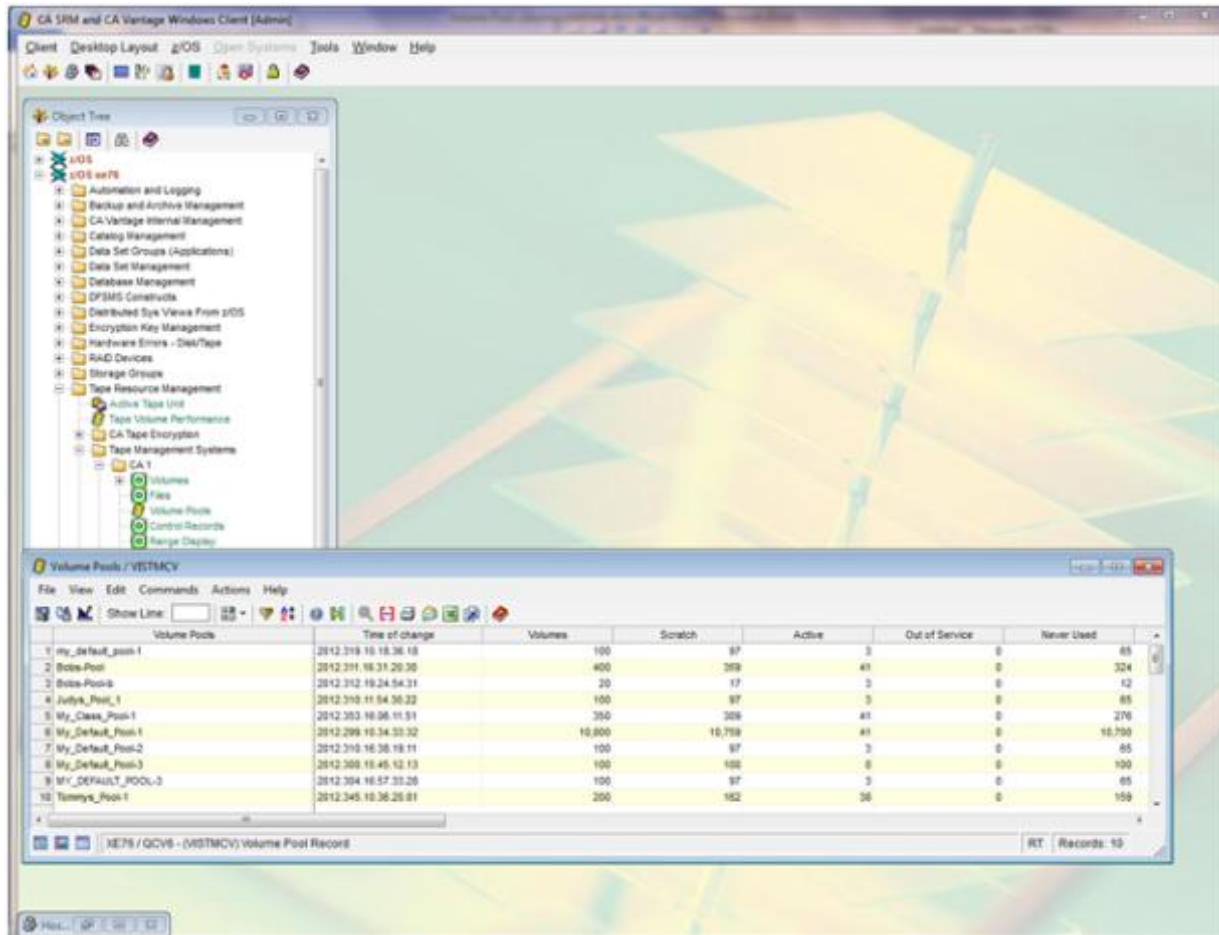
The following are features of Volume Pool Monitor.

- User created volume pools and alerts.

- Display of volume pools via z/OS console or ISPF.

- Constant monitoring of volume pools via CTS task.

- Notification via email or WTO when "alert" conditions are met.

- Substitution variables which can be used in emails/WTOs and alerts.

- History records for volume pools which can be used in spreadsheets.

- Variables updated by CA 1 programs (TMSCLEAN, TMSCOPY, and TMSVMUPD)

- CTS ISPF panels to maintain VPM

Volume Pool Monitor - Data flow

Create:
- **Emails**
- **WTOs**

CTS

CAI.SEND

ISPF Edit

APEC, others

VPM

VDB

CTSMAIL → Send email

→ Issue WTO

CTS ISPF

Create:
- **Volume Pools**
- **Alerts**
- **Variables**

TMC

```
SDSF SYSLOG    6785.101 XE90 XE90 01/08/2013 0W
COMMAND INPUT ===>
090  CA$F501I CTSWTO Informational message 172
090  Alert triggered on 01/08/2013
```

VPM can
- **Send email**
- **Issue WTO**

Audit

TMSCLEAN

TMSCPY

TMSVMCPD

TMC DSN = CAI.TMC

VDB DSN = CAI.TMC.V
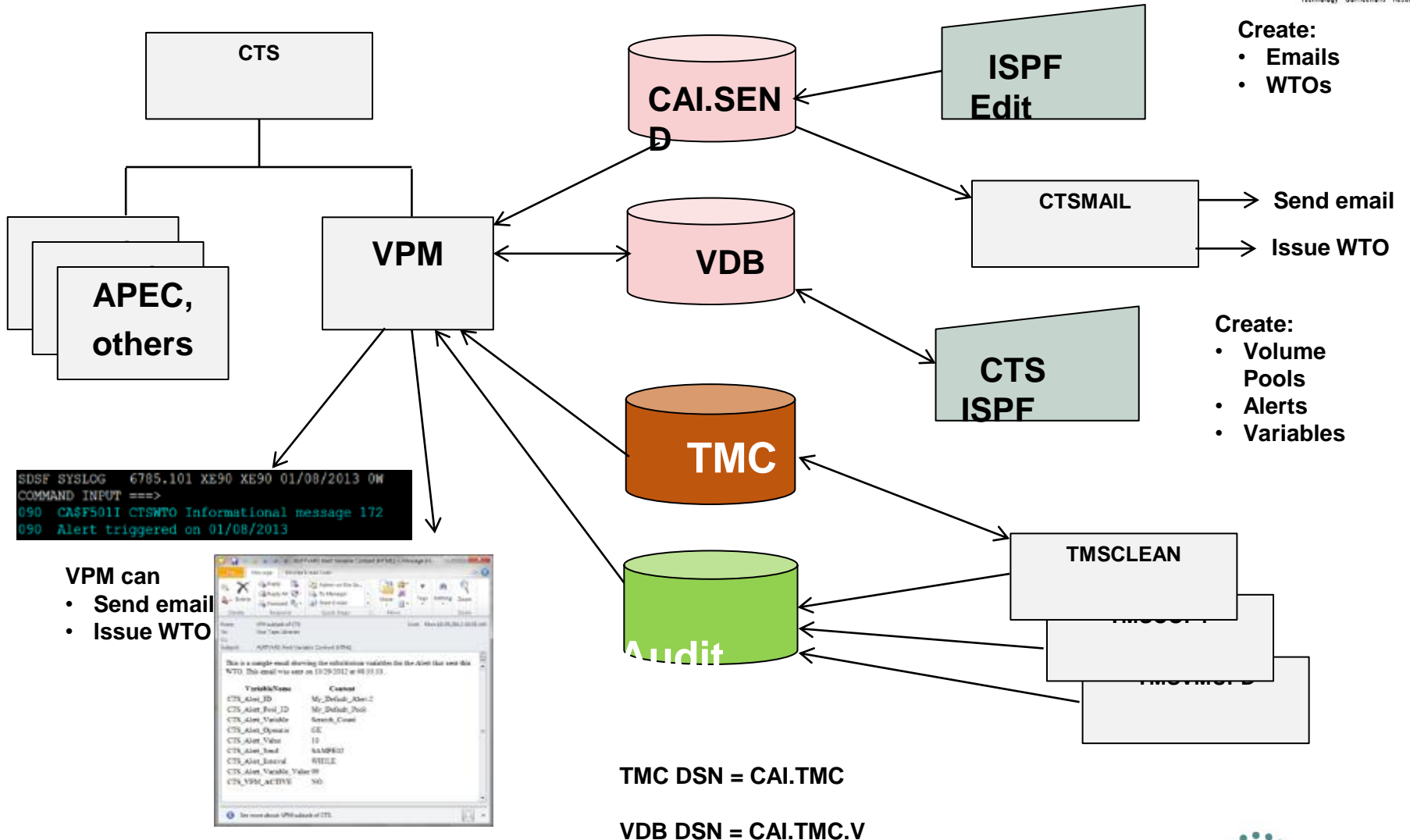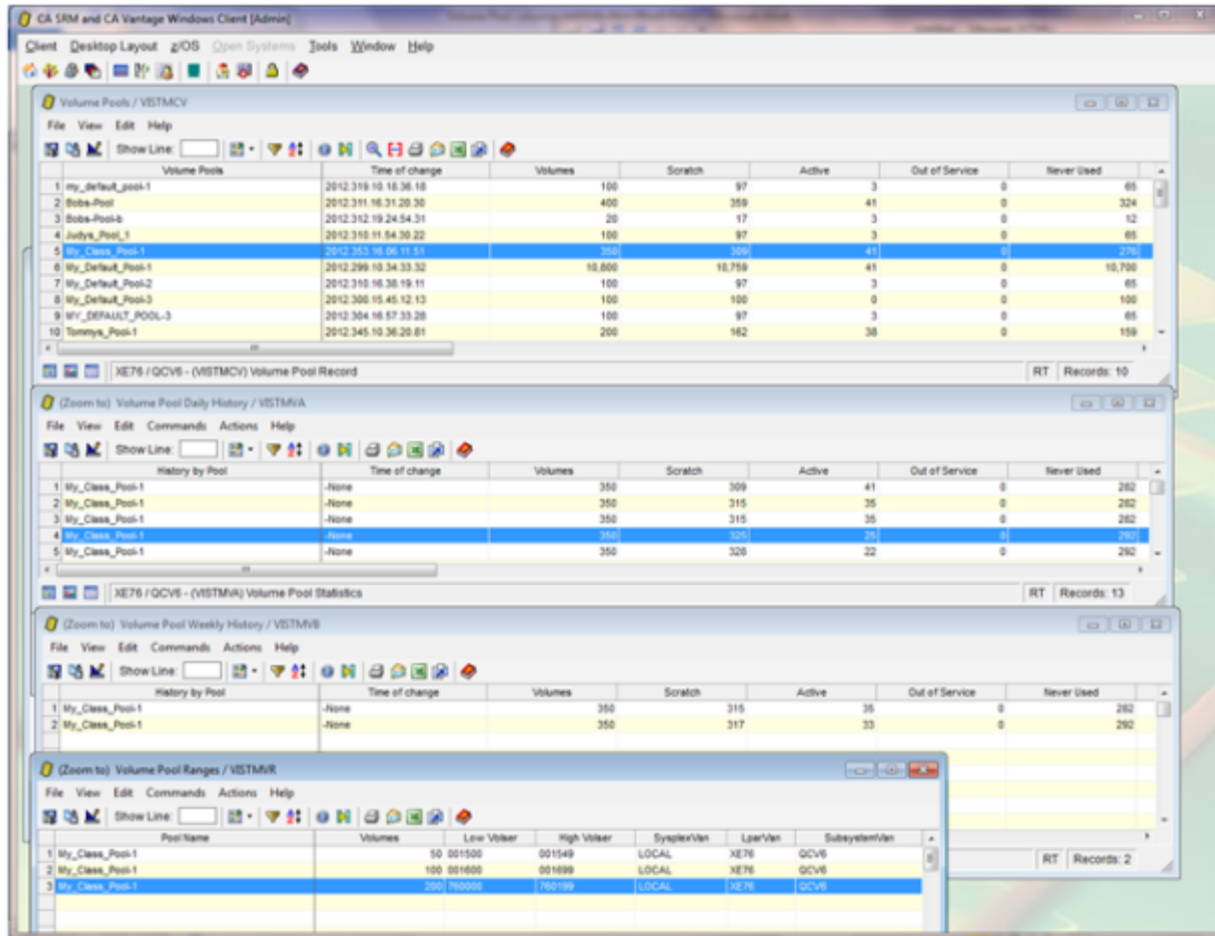
# Volume Pool Monitor – New Pool Object in CA Vantage/GMI

Volume Pool Monitor – New History Object in CA Vantage/GMI

VPM – email input

/* Sample for Class   */

EMAIL

x-TO:**&Notify_for_My_Class_Alert-1&**

x-TITLE:Shortage of Scatch tapes in **&CTS_Alert_Pool_ID&**

x-PRNTFR:Volume Pool Monitor

x-FMT: HTML

This alert occurred on **&SYSDATE&** at **&SYSTIME&.**

The number of scratch tapes has dropped below **&CTS_Alert_Value&.**

This email will be sent every **&CTS_Alert_Interval&** hours until

the shortage is corrected.

VPM – email output

From: Volume Pool Monitor
Sent: Monday, January 07, 2013 2:19 PM
To: Cravy, Joe B
Subject: Shortage of Scratch tapes in My_Class_Pool-1

This alert occurred on 01/07/2013 at 14:19:08.

The number of scratch tapes has dropped below 500. This email will be sent every 01 hours until the shortage is corrected.

VPM Variables

- The number of SCRATCH, ACTIVE and OUT-OF-SERVICE tapes within any defined volume RANGES

- Volumes my exist within multiple ranges

- In addition to specific numbers, percentages may also be used

- Utility Variables include the following;
  - TMSCLEAN – RC, Current Scratch Tapes, Date/Time of last run, number of tapes scratched and un-cataloged
  - TMSCOPY – RC, Active & Available DSNB's, Date/Time of last backup, Audit records and Audit records backed up
  - Vaulting – RC, Date/Time of last run, tapes to and from offsite locations, tapes moved

CA 1 – Health Check Enhancements

- CA1_USED_DSNB_FREE_CHAIN
  - This Health Check runs the entire free DSNB chain
  - Changed to run once-a-week instead of daily
  - Now has some PARM settings to allow a delay of xx seconds after every yyyyy DSNB's have been read
  - Validation that the real end of the DSNB chain has been reached
  - Prevent an abend if the Health Check is running and CA 1 is shutdown
  - Added recently with RO59233, a more detailed description can be found in the documentation updates in RI59234.

Documentation Changes

- Public access to the majority of CA 1 documentation
- Still in PDF format, but outside the firewall
  - Can find information with simple YAHOO/GOOGLE searches
- CA 1 Programming Guide will still be restricted to clients that have a license for a CA product and logon through CA Support
- For example, a GOOGLE search of IEFTMS9 brought up the link to the HTML formatted CA 1 Message Reference Guide.

CA 1 – Coming Soon

- Multiple TMC Performance Improvement
  - If multiple TMC's are used on multiple LPAR's within a single GRS/MIM environment, enqueues on one TMC may impact processing against another TMC
  - A special usermod (zaps) is available to allow a unique RNAME to be used, but often has to be refit and not possible to change without an IPL of ALL systems.
  - A new option is being added to TMSXTEND to allow a unique RNAME to be used on the NEW TMC being created. Will change the RNAME to include the volser of the TMC/AUD and the dataset name of the TMC/AUD
  - Can be activated/inactivated without an IPL, maintaining our 24X365 pledge
  - Option to manually enable if all but 1 system are shutdown

CA 1 – Coming Soon (cont.)

- Other TMSXTEND changes
  - If there is a syntax error in the CPULIST (used by the TMSAUDEX sub-task), the TMSXTEND utility will abend quickly rather than wait for the TMSBLDVR sub-task to also complete before abending.
  - Present a list of all CPU's detected (either from the AUDIT file or from the INCLUDE/EXCLUDE statements) to be validated early, to insure that if the wrong CPU is included it can be detected and corrected earlier.
  - Present new WTO's as TMSXTEND is running to indicate how far along the processing is.

CA 1 – Coming Soon (cont.)

```
TMSXT01I TMC EXTEND STARTING.

TMSXT33I ------ TEST MODE IS ACTIVE -----

TMSXT25I OPEN/CLOSE TMC FOR OUTPUT TO PREVENT BATCH PROCESSING.

TMSXT05I ATTACH TMSBLDVR TO COPY/EXTEND TMC.

TMSXT03I ATTACH TMSAUDEX FOR STATUS OF CPUS.

TMSXT07I WAIT FOR SUBTASKS.

TMSXT04I CPU STATUS TABLE OBTAINED.

TMSXT09I SIGNAL ALL CPUS TO ACCESS NEW TMC.

  CPU Table report follows  731

  CPU  Last Acc Date     Inc/Excl Status

  ---- ---------------- -------- ----------------

  XE90 09AUG,2013 13:02 INCLUDE

  XE76 08AUG,2013 10:43 EXCLUDE

*49 TMSXT98I REPLY 'C'-CONTINUE OR 'M'-ABEND

  R 49,C

*50 TMSXT95I REPLY 'S' FOR TMSXTEND STATUS

 TMSVR16I  05% OF THE COPY/EXTEND HAS COMPLETED.

 TMSVR16I  10% OF THE COPY/EXTEND HAS COMPLETED.
```

CA 1 – Coming Soon (cont.)

- Multiple CTSSYNC changes to better sync an IBM SMS-managed library with CA 1
  - SYNCTEST processing
    - Does not actually update OAM with the correct status of the volume based on what CA 1 indicates the volume status to be
    - Checks if both the VOLCAT (TCDB) and Library Manager are in-sync themselves

- An example of the new error

  OUT OF SYNC: TVIUSEA = S & TVILCAT = UN

- For the meaning of TVILCAT, refer to the IBM DFSMS Object Access Method Planning, Installation, and Storage Administration Guide for Tape Libraries

CA 1 – Coming Soon (cont.)

- New CTSXLIST utility
    - COPY/Export (unlike MOVE/Export) does not drive the OAM CBRUXEJC exit
    - This new utility will read the STATUS file (file-3) from the Virtual Volume used to pass the list of volumes to be MOVE/Exported and drive the CA 1 CBRUXEJC exit as if a MOVE/Export was performed
    - Allows for the TMC volume record for each Exported volume to have an ACTVOL pointer to the physical volume the copy resides upon.

CA 1 – Coming Soon (cont.)

- Support for FREEVOL=EOV
  - Adding support for Label Anamoly processing so that FREE=EOV can be coded
  - Only 1st volume of a Multi-Volume set must be specified
  - Will obtain the Next-Volume from the TMC if EOV is reached prior to EOJ
- Retention / Scratch Processing changes
  - Adding the ability to EXCLUDE specific volsers or ranges of volumes from TMSCLEAN scratch processing (INCLUDE had previously been added)
  - Change SCRATCH processing so that if a volume is expired but has never gone through CLOSE processing, it will be kept a minimum of 5 days since creation

Summary

- CA 1 continues to add new features and enhancements to simplify and reduce the administration of tapes and virtual tapes, providing a comprehensive end to end management or your entire tape environment.

- Implementation of Agile development techniques allows us to more quickly meet the needs and requests from our extensive client base.